

In the Claims

1. (Currently amended) An apparatus for increasing fractionation capacity and efficiency of chemical compounds within a preexisting distillation column with a vessel having at least one preexisting fractionation tray deck with a multiplicity of openings, comprising:

a conversion microdisperser having a top wall and a side wall system adjacent to the top wall, the side wall system comprising a plurality of side walls, each side wall being located in one of a plurality of planes normal to the plane defined by the top wall, the top wall and each side wall of the side wall system having a plurality of apertures, the microdisperser configured to attach to the fractionation tray deck and overlie at least one of the multiplicity of openings such that vapor from beneath the tray deck flows through the microdisperser to interact with liquid flow above the tray deck.

2. (Previously presented) The apparatus of Claim 1 wherein the side wall system comprises two side walls each having a different number of the apertures.

3. (Original) The apparatus of Claim 1 wherein the microdisperser is a valve.

4. (Original) The apparatus of Claim 3 wherein the valve has a vapor deflecting perforation such that the vapor has greater contact with the liquid.

5. (Previously presented) The apparatus of Claim 1 wherein the microdisperser is a bubble promoter.

6. (Previously presented) The apparatus of Claim 1 wherein the microdisperser is configured to overlie at least two of the openings, the two openings separated by a beam supporting the fractionation tray deck.

7. (Previously presented) The apparatus of Claim 1 wherein the plurality of apertures of each side wall of the side wall system are spaced evenly from each other and distributed throughout each side wall.

8. (Previously presented) The apparatus of Claim 1 wherein the number of apertures of the top wall is greater than the number of apertures of any side wall of the side wall system.

9. (Previously presented) The apparatus of Claim 1 wherein the top wall has at least six apertures for each of the at least one of the multiplicity of openings.

10. (Previously presented) The apparatus of Claim 1 wherein the plurality of apertures of the top wall define a plurality of groups each having a different number of apertures, wherein the groups are separated from one another by a distance greater than a maximum distance between any two adjacent apertures ~~with~~ within a particular group.

11. (Original) The apparatus of Claim 5 wherein the bubble promoter has at least one vapor deflecting perforation such that the vapor has greater contact with the liquid.

12. (Previously presented) The apparatus of Claim 1 wherein the microdispenser is configured to attach to the fractionation tray deck and overlie two or more openings of the tray deck.

13. (Previously presented) The apparatus of Claim 2 wherein the total number of apertures defined by the top wall is greater than the total number of apertures defined by the side wall system.

14. (Previously presented) The apparatus of Claim 1 wherein the plurality of apertures of the top wall are spaced evenly from each other and distributed throughout the top wall.

15. (Previously presented) The apparatus of Claim 1 wherein the microdispenser is configured to be installed at or near a tray support beam.

16. (Currently amended) The apparatus of Claim 1 wherein at least one of the apertures of the top wall and at least one of the apertures of the side wall system are different in size.

Claims 17-38. (Canceled).

39. (Currently amended) An apparatus for increasing fractionation capacity and efficiency of chemical compounds within a pre-existing distillation column with a vessel having at least one pre-existing fractionation tray deck with a multiplicity of openings, comprising:

a conversion microdispenser having a top wall and at least two side walls, the top wall being located in a first plane and each of the at least two side walls being located in one of a plurality of planes normal to the first plane, the top wall and each of the at least two side walls having a plurality of apertures, the microdispenser configured to attach to the fractionation tray deck and overlie ~~overly~~ at least one of the multiplicity of openings such that vapor from the tray deck flows through the microdispenser to interact with liquid flow above the tray deck.

40. (Previously presented) The apparatus of Claim 39 wherein the microdispenser is a valve.

41. (Previously presented) The apparatus of Claim 40 wherein the valve had a vapor deflecting perforation such that the vapor has greater contact with the liquid.

42. (Previously presented) The apparatus of Claim 39 wherein the microdispenser is a bubble promoter.

43. (Currently amended) The apparatus of Claim 39 wherein the microdispenser is configured to overlie ~~overly~~ at least two of the openings, the two openings separated by a beam supporting the fractionation tray deck.

44. (Previously presented) The apparatus of Claim 39 wherein the plurality of apertures of the at least two side walls are spaced evenly from each other and distributed throughout the at least two side walls.

45. (Previously presented) The apparatus of Claim 39 wherein the number of apertures of the top wall is greater than the number of apertures on any one of the at least two side walls.

46. (Previously presented) The apparatus of Claim 39 wherein the top wall has at least six apertures for each of the at least one of the multiplicity of openings.

47. (Previously presented) The apparatus of Claim 39 wherein the plurality of apertures of the top wall define a plurality of groups each having a different number of apertures wherein the groups are separated from one another by a distance greater than a maximum distance between any two adjacent apertures within a particular group.

48. (Previously presented) The apparatus of Claim 42 wherein the bubble promoter has at least one vapor deflecting perforation such that the vapor has greater contact with the liquid.

49. (Currently amended) The apparatus of Claim 39 wherein the microdispenser is configured to attach to the fractionation tray deck and overlie ~~overly~~ two or more openings of the tray deck.

50. (Previously presented) The apparatus of Claim 39 wherein the total number of apertures defined by the top wall is greater than the total number of apertures defined by all of the side walls.

51. (Previously presented) The apparatus of Claim 39 wherein the plurality of apertures of the top wall are spaced evenly from each other and distributed throughout the top wall.

52. (Previously presented) The apparatus of Claim 39 wherein the microdispenser is configured to be installed at or near a tray support beam.

53. (Previously presented) The apparatus of Claim 39 wherein at least one of the apertures of the top wall and at least one of the apertures of the at least two side walls are different in size.